

AD A117423

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18 JUN 1982

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DESIGN OF A SMALL UNIT DRILL TRAINING SYSTEM

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Combat readiness is critically dependent on unit training programs which units have difficulty in constructing and executing in a straight-forward, efficient manner. Cutbacks in TRADOC resources for resident institutional training have placed a heavy individual-soldier-training load on units, whereas units traditionally have concentrated on collective training which builds on those individual skills imparted at the schools and training centers. Furthermore, the collective-training load in units has itself effectively grown through adoption of the relatively unstructured Army Training and Evaluation Program (ARTEP), with its many mission- and task-training requirements, in place of the highly structured step-by-step Army training Programs. And all the while, the time available to prepare for and conduct training in units has effectively shrunk for a variety of reasons. This paper first depicts the major problems confronting combat unit training, and then describes a significant unit training innovation recently designed by ARI.

Background. A brief description of an earlier project (1), which aimed to develop a unit training system for individual soldier training, will provide a useful perspective. In that project, performance-oriented lesson plans were prepared for each task that each soldier, in a unit such as a rifle squad, is responsible for performing according to official Soldier's Manuals. In addition, training management guides for each set of Soldier's Manual tasks comprising a duty position, such as rifleman or radio-telephone operator, were also carefully prepared. A feature of the training management guide was explicit information and terminology which integrated this individual training subsystem into the Battalion Training Management System (BTMS), which is the official unit training system. As part of the overall research effort, workshops for both the BTMS and the individual training subsystem were developed by the Army Training Board (proponent of the BTMS and research sponsor) and ARI.

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Individual soldier
that may be characterized

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requested by the infantry
integrated training system

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in which individual training would support collective training. In addition, the Army Training Board requested ARI to design a prototype integrated training system and corresponding system development guideline to be used by the TRADOC schools to fulfill the Chief of Staff's directive to standardize training in units whenever practical.

A conventional research strategy was adopted that included issue identification by problem review, problem solving by system design, and system refinement through testing. The final step was to design a general guideline to assist TRADOC training system developers. Thus, the team began by reviewing the reasons for the failure of the previous individual training system (as described above), examined the BTMS concept intended to drive integration of individual and collective training (the ARTEP Soldier's Manual Interface), and then reviewed the key unit training documents--the Soldier's Manual and the Army Training and Evaluation Program (ARTEP) for light infantry (the combat arm selected for study by the research sponsor). Regarding the ARTEP Soldier's Manual Interface, we concluded that it was not used because the number of Soldier's Manual tasks identified for each unit mission was too high to be of practical use. The Soldier's Manual was considered, at the time of review, to be an inadequate training support for inexperienced trainers. The ARTEP was similarly considered to lack the specificity required to support inexperienced trainers. Numerous training supports for individual and collective training do exist, but trainers generally lack the time to pull these diverse materials together and to construct lesson plans from them. Furthermore, individually produced lesson plans would tend away from standardization, rather than towards it. Thus, a fairly clear picture of training system needs and problems emerged from this review.

A New Drill Training System

The new training system is keyed to the traditional unit training priority--collective training, as represented by ARTEP mission tasks. The system effectively defines a new form of unit task (based on an ancient training concept) which bridges the gap between Soldier's Manuals and ARTEPs--namely, the Drill. To facilitate attention to detail by trainers and evaluators, Drills were defined in concept to deal with relatively brief unit activities, and further, to apply only to relatively small units (e.g., Mech Platoon, Armor Platoon, rifle squad, fireteam, etc.). Table 2 presents the defining characteristics of Drills. Considerable effort was spent by the research team analyzing the ARTEP to identify candidate Drills based on these characteristics. After review by subject matter experts from the Army Training Board and the Infantry School, 16 Drills were selected (see Table 3) from a list of candidates. Next, the research team designed a new format for defining collective tasks as illustrated by the sample Drill training objective shown in Figure 1.

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Individual training was systematically integrated with collective, Drill training in one of three ways. As the first preference, individual performance requirements were explicitly included in a Drill's performance requirements or standard. Individual skills which incurs safety hazards or take a long time to train were identified as Drill training prerequisites; since each Drill encompasses only a few actions, the list of prerequisites was always small. Finally, certain Soldier's Manual tasks which are easy to train, but only partially covered by a Drill's performance standards, were identified for optional training in the field.

To insure that commanders understand how Drill training efficiently supports ARTEP mission training, a Drill training management guide was designed which shows the specific ARTEP mission tasks that each Drill prepares their units to perform. The Drills in the prototype Drill Training Package for Light Infantry Squads prepared by the research team were in fact defined so that most Drills served as building blocks for several ARTEP missions and mission tasks. This fact is illustrated by a portion of the training management guide shown in Table 4. The management guide also contains information required to schedule the Drills in an effective training sequence, along with resource requirements.

To assist trainer preparation, comprehensive, but easy to read lesson plans for each Drill were designed. To assist the trainer when actually conducting training in the field, the lesson plans were summarized and printed in a booklet that fits into the field jacket's pockets. A portion of one of the lesson plans is shown in Figure 2. Note that the formal training standards are well cued, and then followed by coaching tips.

Finally, to assist the evaluation of unit Drill performance by training supervisors, a booklet containing evaluation checklists for the Drills was designed. A sample checklist is shown in Figure 3.

Field Testing

The complete prototype Drill Training Package for light infantry squads was prepared by ARI with the support of the Army Training Board, the Infantry School, and a Brigade Commander of the 4th Infantry Division (COL Burba, who was independently working on a Battle Drill training system for Mechanized Infantry Squads). This training package was tried out by the rifle squads in two infantry companies during two weeks of field training in Nov 81. The field tryout identified the need for only minor changes, such as the addition of one diagram and, in a few instances, improved wording for clarity. It was clear from chain of command approval, and observed use by platoon and squad sergeants, that the prototype Drill Training Package met unit needs. Shortly after returning from the field, both the participating test battalion, and its parent brigade requested additional copies. Within

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a few days, the colocated infantry brigade requested multiple copies for use. Within a few weeks, units from Forts Bragg, Carson, Campbell, and Lewis also requested a total of approximately 600 copies for use. After these requests were satisfied, TRADOC HQ decided to print and distribute another 600 copies to the MACOMs.

The research plan had been to prepare a Drill System Developer's Guideline for TRADOC based on practical experience gained from the research efforts to design only sample portions of a Drill Training Package. The initial project plan was altered as the result of three categories of events:

a. the system design effort proved to be so complex that design experience based on the research required to construct an entire training package appeared to be necessary for writing a valid Drill Developer's Guideline.

b. resource limitations at the Infantry School precluded School completion of the prototype package in time to meet TRADOC needs.

c. the enthusiastic support of the FORSCOM CDR, the Army Training Board's President, COL Hagan, and DCSOPS-Training staff, as work progressed, conveyed the feeling that a training system of great potential was taking shape which deserved to be fully developed and tested.

At the time this report was prepared, the Guideline for Designing Drill Training Systems was undergoing favorable review by TRADOC for publication in a Regulation.

References:

1. Bialek, H. M., Taylor, J. E., Melching, W. H., Hiller, J. H., and Bloom, R. D. "Continuation of Development of an Individual Extension Training System for Managing and Conducting Training in the Army Unit," ARI Technical Report TR-78-B1, 1978.
2. Bialek, H. M., Brennan, M., and Hiller, J. H. "Development and Implementation of a Performance Based Training and Evaluation System for the Combat Arms," ARI Technical Report TR-79-B4, 1979.
3. Funk, S. L., Johnson, C. A., Batzer, E., Gambell, T., Vandecaveye, G., and Hiller, J. H. "Training Detractors in FORSCOM Divisions and How They are Handled," ARI Research Report 1278, 1980.

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TABLE 1

SYSTEM DESIGN ISSUES FOR INDIVIDUAL TRAINING IN UNITS

<u>SYSTEM FUNCTION</u>	<u>ISSUES</u>
MOTIVATION OF LEADERS	<ul style="list-style-type: none">• EXCLUDING WEAPONS AND PHYSICAL TRAINING, INDIVIDUAL TRAINING IS PERCEIVED AS LOW PRIORITY• SKILL QUALIFICATION TESTING (SQT) COVERS TOO FEW TASKS BY PERFORMANCE TESTING TOO INFREQUENTLY TO PROVIDE ADEQUATE INCENTIVE• SQT ALSO IS FREQUENTLY REPORTED AS A DISTRACTOR TO UNIT TRAINING, SINCE IT IS EXTERNALLY IMPOSED• EXCLUDING SQT, WEAPONS AND PHYSICAL TRAINING, THERE IS NO EFFECTIVE ACCOUNTABILITY
MOTIVATION OF TRAINERS/SUPERVISORS	<ul style="list-style-type: none">• PERCEIVED LACK OF COMMAND EMPHASIS CONVEYS LITTLE INCENTIVE• TIME MUST BE SPENT DURING OFF-DUTY HOURS TO PREPARE• FREQUENT DISRUPTIONS OF SCHEDULED TRAINING MAKE TIMELY PREPARATION DIFFICULT.• LACK OF PERFORMANCE TESTING OF TRAINEES PRECLUDES REWARD FOR SUCCESS



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TABLE 1 (CONT.)

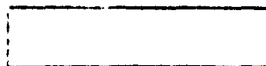
IDENTIFICATION OF
TRAINING NEEDS

- LARGE NUMBER OF DUTY POSITIONS, INDIVIDUAL SOLDIERS AND SOLDIERS MANUALS (SM) TASKS WOULD OVERWHELM CENTRALIZED DIAGNOSTIC TESTING
- THE NUMBER OF SM TASKS LISTED FOR MISSIONS IN THE ARTEP SM INTERFACE IS TOO LARGE FOR PRACTICAL USE BY DECENTRALIZED MANAGEMENT
- DIAGNOSTIC TESTING IS VERY EXPENSIVE, ESPECIALLY FOR TIME
- RAPID TURNOVER/TURBULENCE OF SOLDIERS DEFEATS DIAGNOSTIC TESTING & LOCAL RECORD KEEPING
- SKILL/KNOWLEDGE TIME DECAY COMPLICATE RECORD KEEPING

PLANNING
AND
SCHEDULING
OF
TRAINING

- SHORTAGES OF RESOURCES MAKE SCHEDULING DIFFICULT
- LOW PRIORITY INDIVIDUAL TRAINING COMPETES POORLY AGAINST OTHER REQUIREMENTS
- TURNOVER/TURBULENCE OF TRAINEES, TRAINERS, AND TRAINING MANAGERS (LEADERS & SUPERVISORS) FRUSTRATES CAREFUL SCHEDULING
- UNPLANNED REQUIREMENTS/DETAILS WRECK SCHEDULES

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TABLE 1 (CONT.)

TRAINER
PREPARATION
AND
CONDUCT
OF
TRAINING

- SHORTAGES OF QUALIFIED TRAINERS (E.G., SQUAD LEADERS) ARE COMMON
- GIVEN LOW PRIORITY OF INDIVIDUAL TRAINING, SMALL EFFORT IS MADE TO PREPARE/REHEARSE TRAINERS
- EXISTING TRAINING SUPPORT DOCUMENTS ARE NOT CONVENIENTLY AVAILABLE TO JUNIOR TRAINERS, AND OFTEN HARD TO READ
- STANDARDIZED LESSON PLANS ARE NOT PREPARED FOR TRAINERS
- JUNIOR TRAINERS TYPICALLY LACK THE KNOWLEDGE, SKILL AND TIME TO PREPARE LESSON PLANS
- TRAINING TYPICALLY IS CONDUCTED AS LARGE GROUP LECTURE

TRAINEE TESTING

- GIVEN LECTURE TRAINING MEDIUM, TRAINEES ARE NOT PERFORMANCE TESTED: INSTEAD ATTENDANCE IS RECORDED
- STANDARDIZED PERFORMANCE TESTS DO NOT EXIST (EXCEPT FOR A FEW FROM THE SQT)

TRAINING EVALUATION
AND
QUALITY CONTROL

- GIVEN LACK OF PERFORMANCE TESTING, EVALUATION IS TYPICALLY PROCESS, INSTEAD OF PRODUCT, BASED
- GIVEN LACK OF PRODUCT MEASUREMENT, ACCOUNTABILITY IS LOW, AND QUALITY CONTROL IS NON-EXISTENT OR IRRELEVANT

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TABLE 2

BATTLE DRILL DEFINITION

TASK, CONDITIONS, STANDARDS

- REQUIRES A RELATIVELY STANDARD SET OF ACTIONS IN A VARIETY OF SITUATIONS--DRILL-LIKE ACTIVITY
- HAS NATURAL STARTING AND STOPPING POINTS (I.E., IS A MEANINGFUL CHUNK OF BATTLE)
- CALLS OUT OFFOR DISPOSITION. AND TERRAIN

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TABLE 3
DRILLS FOR LIGHT INFANTRY SQUADS

1ST TRAINING SET	1. FIRETEAM MOVES IN WEDGE FORMATION
	2. SQUAD MOVES IN TRAVELING OVERWATCH
	3. SQUAD CROSSES A DANGER AREA
	4. SQUAD TAKES ACTION ON CONTACT (TRAVELING OVERWATCH)
	5. SQUAD MOVES IN BOUNDING OVERWATCH
2ND TRAINING SET	6. SQUAD TAKES ACTION ON CONTACT (BOUNDING OVERWATCH)
	7. SQUAD EMPLOYS DIRECT FIRE
	8. SQUAD PREPARES TO PROVIDE COVERING FIRE
	9. SQUAD PROVIDES COVERING FIRE
3RD TRAINING SET	10. SQUAD OCCUPIES POINT AMBUSH POSITION AND EXECUTES AMBUSH AND SEARCH
	11. FIRETEAM MANEUVERS USING HIGH/LOW CRAWL
	12. FIRETEAM ADVANCES MOVING IN SHORT RUSHES
	13. SQUAD EXECUTES FIRE AND MANEUVER
	14. SQUAD CLEARS A ROOM/BUILDING
	15. SQUAD DISENGAGES
	16. SQUAD EXECUTES DEFENSE/WITHDRAWAL TO SUPPLEMENTARY POSITIONS (URBAN AREA)

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TABLE 4
SAMPLE SQUAD AMTIP MISSIONS & TASKS SUPPORTED BY EACH DRILL

MISSIONS	TASKS	DRILL NUMBER															
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
RAID	PREPARE TO CONDUCT RAID																
	MOVE TO OBJECTIVE AREA	X	X			X											
	EXECUTE RAID																
	CONDUCT WITHDRAWAL	X															X
AMBUSH PATROL	PREPARE FOR AMBUSH PATROL																
	MOVE TO AMBUSH SITE																
	EXECUTE AMBUSH	X	X			X											
	SEARCH OBJ AREA & RETURN							X	X								
ANTI- ARMOR AMBUSH	PREPARE ARMOR AMBUSH																
	SELECT AMBUSH																
	OCCUPY AMBUSH SITE																
	EXECUTE AMBUSH																
	CONDUCT WITHDRAWAL & REORG	X															X

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DRILL TITLE: SQUAD PROVIDES COVERING FIRE

TASK: SQUAD PROVIDES COVERING FIRE FOR AN ASSAULTING SQUAD.

CONDITIONS:

FRIENDLY: PLATOON IS CONDUCTING A HASTY ATTACK.

ENEMY: ENEMY IS LOCATED ON THE PLATOON OBJECTIVE ROUGHLY 200 METERS FROM THE OVERWATCHING SQUAD.

SET-UP DIRECTIONS:

TRAINING SITE: TERRAIN PROVIDES FOR:

- PLATOON OBJECTIVE TO BE OCCUPIED BY SQUAD-SIZED OPFOR ELEMENT.
- PROTECTED ROUTE OF APPROACH TO OBJECTIVE FOR ASSAULTING SQUAD.
- COVERED AND CONCEALED POSITIONS FOR OVERWATCHING SQUAD TO COVER THE OBJECTIVE BY OBSERVATION AND FIRE.
- OPFOR: EMPLACE TWO OR THREE OPFOR RIFLEMEN IN COVERED/CONCEALED POSITIONS ON OBJECTIVE. INSTRUCT OPFOR TO REMAIN IN POSITION AND OPEN FIRE ON SIGNAL FROM TRAINER. FIRING RATES ARE AS FOLLOWS:
 - INITIALLY DELIVER HIGH RATE OF FIRE (EACH MAN FIRES ONE ROUND PER SECOND) FOR ABOUT 10 SECONDS.
 - THEN FIRE AT REDUCED RATE IN RESPONSE TO OVERWATCHING SQUAD'S FIRE UNTIL ASSAULT BEGIN.

FIGURE 1. SAMPLE DRILL TRAINING OBJECTIVE

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<p>• INCREASE RATE OF FIRE IN RESPONSE TO ASSAULT ELEMENT'S FIRE, OR ON SIGNAL FROM TRAINER.</p>	
<p><u>UNIT:</u></p> <p>SQUAD IS IN PLACE AFTER HAVING SUCCESSFULLY EXECUTED THE DRILL TASK "SQUAD PREPARES TO PROVIDE COVERING FIRE."</p>	
<p><u>START/FINISH DIRECTIONS:</u></p> <p>• START DRILL WHEN SQUAD IS IN POSITION BY SIGNALING OPFOR TO COMMENCE FIRING.</p> <p>• END DRILL WHEN SQUAD HAS SHIFTED FIRE IN RESPONSE TO SIGNAL THAT THE ASSAULT HAS BEGUN. (WHEN THIS DRILL IS RUN CONCURRENTLY WITH "ASSAULT" DRILL, END DRILL AFTER ASSAULTING ELEMENT HAS SWEEPED THE OBJECTIVE.)</p>	
<p><u>PERFORMANCE STANDARDS:</u></p> <p>1. SQUAD RETURNS HEAVY VOLUME OF FIRE FROM COVERED AND CONCEALED POSITIONS WHEN THE ENEMY OPENS FIRE.</p> <p>2. SQUAD REDUCES FIRE WITHIN 10 SECONDS AFTER ENEMY REDUCES THEIR RATE OF FIRE.</p> <p>3. SQUAD MAINTAINS APPROPRIATE RATE OF FIRE, AND AVOIDS LULLS CAUSED BY RELOADING, MALFUNCTIONS, ETC.</p> <p>4. SQUAD INCREASES VOLUME OF FIRE WHEN ITS LEADER OR THE ASSAULTING SQUAD SIGNALS.</p> <p>5. SQUAD SHIFTS ITS FIRE ON SIGNAL FROM ITS LEADER BEFORE THE ASSAULT ELEMENT REACHES ITS OBJECTIVE.</p>	

FIGURE 1. (CONTINUED) SAMPLE DRILL TRAINING OBJECTIVE

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(2) During the walk-thru:

(a) Signal OPFOR to commence firing. When OPFOR begins firing, order squad to open fire, and apply the Standard:

- "SQUAD RETURNS HEAVY VOLUME OF FIRE FROM COVERED AND CONCEALED POSITIONS WHEN THE ENEMY OPENS FIRE."

Coach soldiers to

- a Remain in position
- b Cover entire sector of fire
- c Use high individual rate of fire
- d Attend to Fireteam Leaders for directions

(b) When OPFOR reduces rate of fire, order squad to reduce its rate of fire and apply the Standard:

- "SQUAD REDUCES FIRE WITHIN 10 SECONDS AFTER ENEMY REDUCES THEIR RATE OF FIRE."

Coach soldiers to

- a Pay attention to Fireteam Leaders
- b Relay Fireteam Leader orders
- c Reduce individual rate of fire (conserve ammunition)

(c) During period of reduced rate of fire, apply the Standard:

- "SQUAD MAINTAINS APPROPRIATE RATE OF FIRE AND AVOIDS LULL CAUSED BY RELOADING, MALFUNCTIONS, ETC."

1 Explain to soldiers that

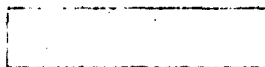
- a They must maintain fire superiority (keep enemy suppressed).
- b Maneuvering element is advancing to assault position.

2 Coach soldiers to

- a Vary individual rate of fire
- b Correct malfunctions immediately
- c Pick up fire for teammate as required

FIGURE 2. SAMPLE PORTION OF A DRILL LESSON PLAN

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SQUAD PROVIDES COVERING FIRE

TASK: SQUAD PROVIDES COVERING FIRE FOR AN ASSAULTING SQUAD.

CONDITIONS:

FRIENDLY: PLATOON IS CONDUCTING A HASTY ATTACK.

ENEMY: ENEMY IS LOCATED ON THE PLATOON OBJECTIVE 200 METERS FROM THE OVERWATCHING SQUAD.

PERFORMANCE STANDARDS:

		GO	NO GO
(a)	• SQUAD IMMEDIATELY RETURNS HEAVY VOLUME OF FIRE WHEN HIT.		
	• SQUAD MAINTAINS COVERED/CONCEALED POSITIONS.		
(b)	• SQUAD REDUCES FIRE WITHIN 10 SECONDS AFTER ENEMY REDUCES THEIR RATE OF FIRE.		
(c)	• SQUAD MAINTAINS APPROPRIATE RATE OF FIRE.		
	• SQUAD MEMBERS PROMPTLY RELOAD AND CLEAR MALFUNCTIONS.		
(d)	• SL/TL SIGNALS TO INCREASE VOLUME OF FIRE PRIOR TO ASSAULT.		
	• SQUAD INCREASES VOLUME OF FIRE.		
(e)	• SL/TL SIGNALS TO SHIFT FIRE FOR ASSAULT.		
	• SQUAD SHIFTS FIRE.		

FIGURE 3. SAMPLE DRILL EVALUATOR'S CHECKLIST

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